

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-23 (cancelled)

24. (previously presented) A method for producing hollow, single-walled carbon nanotubes having diameters less than about 3 nanometers by catalytic decomposition of one or more gaseous carbon compounds comprising the steps of:

(1) forming a gas phase mixture of:

(a) a carbon feed stock gas comprising one or more gaseous carbon compounds, each said compound having one to six carbon atoms and only H, O, N, S or Cl as hetero atoms, optionally admixed with hydrogen, a diluent or mixtures thereof; and

(b) a gas phase metal containing compound which is unstable under reaction conditions for said catalytic decomposition, and which forms metal containing catalysts which act as decomposition catalysts under reaction conditions;

(2) and conducting said catalytic decomposition reaction under decomposition reaction conditions and thereby producing said hollow, single-walled carbon nanotubes having diameters less than about 3 nanometers.

25. (previously presented) A method for producing hollow, single-walled carbon nanotubes having diameters less than about 3 nanometers comprising the steps of:

(1) forming a gas phase mixture of:

(a) a carbon feed stock gas comprising one or more gaseous carbon compounds, each said compound having one to six carbon atoms and only H, O, N, S or Cl as hetero atoms, optionally admixed with hydrogen, a diluent or mixtures thereof; and

(b) a gas phase metal containing compound which forms metal containing catalysts which act as decomposition catalysts under reaction conditions; and

(2) conducting a reaction under said reaction conditions and thereby producing said hollow, single-walled carbon nanotubes having diameters less than about 3 nanometers.

26. (previously presented) The method as defined in claim 24, wherein said carbon feedstock gas comprises carbon monoxide.

27. (previously presented) The method as defined in claim 24, wherein said carbon feedstock gas consists essentially of carbon monoxide.

28. (previously presented) The method as defined in claim 24, wherein said decomposition reaction occurs at temperatures between approximately 400°C and approximately 1300°C.

29. (previously presented) The method as defined in claim 24, wherein said decomposition reaction occurs at temperatures between approximately 400°C and approximately 1100°C.

30. (previously presented) The method as defined in claim 24, wherein said decomposition reaction occurs at temperatures between approximately 400°C and approximately 900°C.

31. (previously presented) The method as defined in claim 24, wherein said decomposition reaction occurs at temperatures between approximately 700°C and approximately 1300°C.

32. (previously presented) The method as defined in claim 24, wherein said decomposition reaction occurs at temperatures between approximately 700°C and approximately 1100°C.

33. (previously presented) The method as defined in claim 24, wherein said decomposition reaction occurs at temperatures between approximately 700°C and approximately 900°C.

34. (previously presented) The method as defined in claim 24, wherein said decomposition reaction occurs at a pressure range of approaching 0 p.s.i.g. through approximately 100 p.s.i.g.

35. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound is mixed with said feedstock by direct injection.

36. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound is in the form of an aerosol.

37. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound is a metal carbonyl.

38. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound comprises iron carbonyl.

39. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound comprises molybdenum carbonyl.

40. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound comprises cobalt carbonyl.

41. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound is Mo(CO)₆.

42. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound is Co₂(CO)₈.

43. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound is a volatile iron compound.

44. (previously presented) The method as defined in claim 43, wherein said volatile iron compound is ferrocene.

45. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound is a volatile manganese compound.

46. (previously presented) The method as defined in claim 45, wherein said volatile manganese compound is methylcyclopentadienyl manganese tricarbonyl.

47. (previously presented) The method as defined in claim 24, wherein said gas phase metal containing compound is a volatile cobalt compound.

48. (previously presented) The method as defined in claim 47, wherein said volatile cobalt compound is cyclopentadienyl cobalt dicarbonyl.

49. (previously presented) The method as defined in claim 24, wherein said gas phase mixture consists essentially of said carbon feed stock gas and said gas phase metal containing compound, optionally admixed with hydrogen, a diluent or mixtures thereof.

50. (previously presented) The method as defined in claim 24, wherein said carbon nanotubes have diameters ranging from about 1 to about 3 nanometers.

51. (previously presented) The method as defined in claim 24, wherein said process provides a yield of single-walled carbon nanotubes greater than about 20 wt%.

52. (previously presented) The method as defined in claim 24, wherein said process provides a yield of single-walled carbon nanotubes greater than about 50 wt%.

53. (previously presented) The method as defined in claim 24, wherein said metal containing catalysts have diameters ranging from 1-10 nm.

Claims 54-55 (cancelled)